

**Claims**

I claim:

1. An input device for receiving an x-y input and input from at least one input actuator on the input device wherein the device is adapted to allow a user to use the device while holding the device in the user's hand with the hand in an open-grip posture with the thumb pointing forward at the top.  
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2. The input device of claim 1 further comprising a device housing with an input sensor to receive input from the user's thumb such that placement of the user's thumb in a position to provide input causes an interaction between the user's hand and a palm fin portion of the housing that contacts the palm of the user, adapted to interact with the length of a user's thumb such that a user with a large hand and long thumb grasps a first segment of the palm fin and a user with a small hand and short thumb grasps a second segment of the palm fin wherein the height of the palm fin at the midpoint of the second segment is less than the height of the palm fin at the midpoint of the first segment.  
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3. An input device adapted for use by a seated user for receiving an x-y input and input from at least one input actuator on the input device; the input device comprising:  
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  - a) a housing adapted to fit within the hand of a user while the user's hand is resting on the user's lap;
  - b) the housing comprising a main body section with a long axis substantially parallel to a line in the body of a user grasping the pointing device running through the arm of the user to the tip of the user's extended thumb;
  - c) the housing further comprising a platform for containment of an x-y input device, the platform placed to be substantially perpendicular to the long axis of the main body section;
  - d) the housing having a channel for placement of the user's index finger;
  - e) the housing having a channel for placement of the user's middle finger;

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*SUB A1*

f) the channels positioned to place the user's index and middle fingers below and substantially orthogonal to the orientation of the user's thumb while the user is grasping the device; and

g) an x-y input sensor placed at the end of the input device distal to the user's wrist such that the x-y input is provided to the x-y input sensor by pivotal movements of the thumb.

*SUB B1*

4. The input device of claim 3 wherein the x-y input is provided by the thumb tip of the user.

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5. The input device of claim 4 wherein the x-y input device is curved to approximate the arc of travel of the thumb tip of the thumb during pivotal travel while a user is grasping the input device.

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*SUB A2*

6. The input device of claim 3 wherein at least one of the input actuators comprises a zero force touch switch.

*SUB B1*

7. The input device of claim 6 wherein the zero force touch switch detects contact of the user's finger.

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8. The input device of claim 6 wherein the zero force touch switch detects the interruption of a beam of light.

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*SUB B3*

9. The input device of claim 8 further comprising an adjustment means for adjusting the placement of the beam of light to allow adjustment of the activation position of the zero force touch switch to accommodate variations in finger length.

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*SUB B1*

10. The input device of claim 9 wherein the placement of the beam of light for a zero force touch switch actuated by the user's index finger and the placement of the beam of light for a zero force touch switch actuated by the user's middle finger are both adjusted by a common adjustment means for adjusting the placement of the beams of light.

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- SUBPART A*
- Sub B*
- Sub C*
11. The input device of claim 8 wherein the placement of the beam of light can be adjusted to accommodate a range of finger lengths via input to an adjustment screw.
12. The input device of claim 3 wherein the x-y input from the user's thumb is provided to a touchpad.
13. The input device of claim 12 wherein the touchpad may be tilted through use of a tilt adjustment screw.
14. The input device of claim 3 wherein the x-y input from the user's thumb is provided to a track ball.
15. The input device of claim 3 wherein the device senses the thumb at a perimeter input position and communicates to software the user's request for x-y movement of the object image under software control until the user's thumb ceases to be detected at the perimeter position.
16. The input device of claim 15 wherein the x-y input from the user's thumb is provided to a touchpad and the perimeter input positions of the touchpad are actuated by pressing tactile cursor movement buttons so as to reduce accidental input of a perimeter input command.
17. An input device for a computer comprising an x-y input sensor positioned related to the locations on the housing intended for the user's thumb and fingers such that the user provides x-y input with the thumb tip by pivotal movement of the straightened thumb.
18. The input device of claim 17 further comprising:
- a scroll select touch switch positioned to be actuated by a movement of the thumb;
  - a zero force touch switch positioned at the bottom of a channel intended to receive and support the index finger of the user such that the movement of the

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index finger tip of a supported channeled index finger actuates the zero force touch switch; and

c) control circuitry to interpret the input from the scroll select touch switch and the zero force touch switch in the index finger channel wherein the circuitry interprets the activation of the zero force touch switch after the onset of a maintained activation of the scroll select touch switch as a request for continued scrolling of a displayed image on the computer's image display for as long as both the scroll select touch switch and the zero force touch switch are activated.

*Subj 5*

19. The input device of claim 17 further comprising:

a) a scroll select touch switch positioned to be actuated by a movement of the thumb to toggle the operation of the x-y input sensor from a first mode to a second mode;

b) a zero force touch switch positioned at the bottom of a channel intended to receive and support the index finger of the user such that the movement of the index finger tip of a supported channeled index finger actuates the zero force touch switch; and

c) control circuitry to interpret the input from the scroll select touch switch and the zero force touch switch in the index finger channel wherein the circuitry interprets the activation of the zero force touch switch after the scroll select touch switch has been used as a request to toggle the operation of the x-y input sensor from a first mode to a second mode as a request for continued scrolling of a displayed image on the computer's image display for as long as the zero force touch switch is activated.

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20. An input device with a zero force touch switch comprising:

a) a light beam traveling from a light source to a light sensor across a channel, the light source connected to circuitry to detect the presence of an object breaking the light beam in the channel; and

b) a means for moving the position of the light beam in the channel.

21. The input device of claim 20 wherein the light source and light sensor move within a housing in response to input transmitted from outside the housing.

- ~~22. The input device of claim 20 further comprising a second zero force touch switch with a second light beam traveling from a second light source to a second light sensor across a second channel, wherein a single input transmitted from outside the housing moves the light source and light sensor within the housing and simultaneously moves the second light source and the second light sensor within the housing.~~

Adopted